LMS/RFS/S04802

Rocky Flats Site

Quarterly Report of Site Surveillance and Maintenance Activities Second Quarter Calendar Year 2008

October 2008

U.S. Department of Energy

Office of Legacy Management

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Acronyms and Abbreviations

AL	aquatic life
Am	americium-241
AOC	Area of Concern
CAD/ROD	Corrective Action Decision/Record of Decision
CDPHE	Colorado Department of Public Health and Environment
COU	Central Operable Unit
CY	calendar year
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ETPTS	East Trenches Plume Treatment System
gpm	gallons per minute
GWIS	groundwater intercept system
LM	Office of Legacy Management
µg/L	micrograms per liter
mg/L	milligrams per liter
M&M	monitoring and maintenance
MSPTS	Mound Site Plume Treatment System
N	nitrogen
NO_2	nitrite
NO_3	nitrate
OLF	Original Landfill
pCi/L	picocuries per liter
PLF	Present Landfill
PLFTS	Present Landfill Treatment System
POC	Point of Compliance
POE	Point of Evaluation
POU	Peripheral Operable Unit
Pu	plutonium-239,240
RCRA	Resource Conservation and Recovery Act
RFCA	*Rocky Flats Cleanup Agreement*
RFLMA	*Rocky Flats Legacy Management Agreement*
RFSOG	*Rocky Flats Site Operations Guide*
Site	Rocky Flats Site
SME	subject matter expert
SPPTS	Solar Ponds Plume Treatment System
Stoller	S.M. Stoller Corporation
TVS	table value standard
U	uranium

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Executive Summary

The U.S. Department of Energy (DOE) Office of Legacy Management is responsible for implementing the final response action selected in the Final Corrective Action Decision/Record of Decision (CAD/ROD) issued September 29, 2006, for the Rocky Flats Site. Prior to the CAD/ROD, cleanup and closure activities were completed in accordance with requirements of the *Rocky Flats Cleanup Agreement* (RFCA). Under the CAD/ROD, two Operable Units were established within the boundaries of the Rocky Flats property: the Peripheral Operable Unit (POU) and the Central Operable Unit (COU). The COU consolidates all areas of the Rocky Flats Site that require additional remedial or corrective actions, while also incorporating practicalities of future land management. The POU includes the remaining, generally unimpacted, portions of the Site and surrounds the COU. The response action in the Final CAD/ROD is no action for the POU, and institutional and physical controls with continued monitoring for the COU. The CAD/ROD determined that conditions in the POU were suitable for unrestricted use. The U.S. Environmental Protection Agency (EPA) subsequently published a Notice of Partial Deletion from the National Priorities List for the POU on May 25, 2007.

The *Rocky Flats Legacy Management Agreement* (RFLMA), signed March 14, 2007, superseded RFCA. RFLMA is a Federal Facility Agreement and Consent Order under the Comprehensive Environmental Response, Compensation, and Liability Act; the Resource Conservation and Recovery Act; and the Colorado Hazardous Waste Act. It is between DOE, EPA Region 8, and the Colorado Department of Public Health and Environment. The purpose of RFLMA is to establish the regulatory framework for implementing the CAD/ROD final response action in the COU and ensuring that the COU t remains protective of human health and the environment. The monitoring, surveillance, and maintenance activities for which quarterly, annual, and 5-year review reports are issued are included in RFLMA Attachment 2, "Legacy Management Requirements."

This report describes surveillance, environmental monitoring, maintenance, and associated operations that were conducted from April 1 through June 30, 2008 (second quarter calendar year 2008), under the CAD/ROD and RFLMA.

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1.0 Introduction

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) is responsible for implementing the final response action selected in the Final Corrective Action Decision/Record of Decision (CAD/ROD) (DOE 2006a) issued September 29, 2006, for the Rocky Flats Site. DOE, the U.S. Environmental Protection Agency (EPA), and the Colorado Department of Public Health and Environment (CDPHE) have chosen to implement the monitoring and maintenance requirements of the CAD/ROD under and as described in the *Rocky Flats Legacy Management Agreement* (RFLMA) (DOE 2007a). Attachment 2 to RFLMA defines the Central Operable Unit (COU) remedy surveillance and maintenance requirements, the frequency for each required activity, and the monitoring and maintenance locations. The requirements include environmental monitoring; maintenance of the erosion controls, access controls (signs), landfill covers, and groundwater treatment systems; and operation of the groundwater treatment systems. RFLMA also requires that the institutional controls, in the form of use restrictions as established in the CAD/ROD, are maintained.

This report is required in accordance with Section 7.0 of Attachment 2 to RFLMA. The purpose of this report is to inform the regulatory agencies and stakeholders of the remedy-related surveillance, monitoring, and maintenance activities being conducted at the Site. DOE-LM provides periodic communications through many means (e.g., this report, Web-based tools, and public meetings).

The *Rocky Flats Site Operations Guide* (RFSOG) (DOE 2008a) was prepared by DOE-LM to serve as the primary internal document to guide work to satisfy the requirements of RFLMA and implement best management practices at the Site.

Several other Site-specific documents provide additional detail regarding the requirements described in Attachment 2 to RFLMA, including all aspects of surveillance, monitoring, and maintenance activities, as well as data evaluation protocols.

Landfill inspection and monitoring tasks follow the format and protocols established in the *Present Landfill Monitoring and Maintenance Plan and Post-Closure Plan* (DOE 2008b) (PLF M&M Plan) and the *Final Landfill Monitoring and Maintenance Plan, Rocky Flats Environmental Technology Site, Original Landfill* (DOE 2006b) (OLF M&M Plan). These plans include detailed information on monitoring groundwater, surface water, subsidence and consolidation, slope stability, soil cover, vegetation, storm water management structures, and erosion in surrounding features so that maintenance actions can be implemented in a timely manner.

Monitoring data and summaries of surveillance and maintenance activities for past quarters can be found in the applicable quarterly reports. Extensive discussion and evaluation of surveillance, monitoring, and maintenance activities are presented each calendar year in the applicable annual report of Site surveillance and maintenance activities.

This report addresses remedy-related surveillance, monitoring, and maintenance activities conducted at the Site during second quarter calendar year (CY) 2008 (April 1 through June 30).

Surveillance and maintenance activities performed in second quarter CY 2008 include:

- Maintenance and inspection of the OLF and PLF;
- Maintenance and inspection of the four groundwater treatment systems;
- Erosion control and revegetation activities; and
- Routine (per RFLMA and the RFSOG) water monitoring.

2.0 Site Operations and Maintenance

2.1 Annual Site Inspection

Annual inspection and monitoring for evidence of significant erosion and violations of institutional controls are required in accordance with RFLMA Attachment 2, Section 5.3.4 and Section 5.3.6.

The following categories were inspected or monitored during the April 14, 2008, annual inspection:

- Evidence of significant erosion in the COU and evaluation of the proximity of significant erosion to subsurface features at the Site (RFLMA Attachment 2, Figures 3 and 4). Appendix A provides the results of the annual inspection. This monitoring included visual observation for precursor evidence of significant erosion (cracks, rills, slumping, subsidence, sediment deposition, and so forth).
- The effectiveness of institutional controls as determined by any evidence of their being violated.
- Evidence of adverse biological conditions, such as unexpected morbidity or mortality, observed during the inspection and monitoring activities.

Physical controls (e.g., signs placed along the COU fence) were also inspected. In addition, it was verified that the Environmental Covenant remains in the Site's Administrative Record and on file in Jefferson County records; this verification is required annually and is a part of the institutional control inspection.

The annual inspection was scheduled to allow adequate observation of surface features after snow cover had melted (and when the surface was dry enough to avoid muddy conditions) and before vegetation growth could obscure land surface features.

To conduct this work, knowledgeable DOE and S.M. Stoller Corporation (Stoller) team staff members (the inspection team) walked down the COU surface to observe the conditions. The areas walked down were designated as Areas A through E and are shown on the maps included in Appendix A. These areas generally coincide with the location of the subsurface features presented in RFLMA Attachment 2, Figures 3 and 4, or they afforded adequate viewing of the surface in these locations (e.g., sloping areas). Several team members were tasked with walking down a particular area or areas identified on the maps. Reference points, such as well heads and roads, were used to orient the team members within the designated inspection areas.

The completed inspection checklists and several photographs illustrating noted conditions are also included in Appendix A.

Marker flags were placed at locations where evidence of the three condition categories listed above was encountered. This way, Site subject matter experts (SMEs) could track their location and follow up. Areas that required evaluation were documented in the Site Observation Log. Rocky Flats field operations SMEs subsequently visited the areas, made minor repairs, collected debris, and determined that the debris was not a significant indication of erosion or exposure of the subsurface. Several areas were noted as having evidence of erosion, possible depressions, or holes, but these appeared to be minor and of very limited areal extent.

The most notable features were several small depressions, sinkholes, or burrowing-animal holes related to the historical East Trenches area. These were filled in, and soil will be added to bring the surface to surrounding contour; the locations will be observed for any continued evidence of depressions or sinkholes.

Marker flags were placed in areas where debris or trash was noticed so that it could be picked up during routine Site work.

There was no evidence that institutional or physical controls had been violated.

On April 8, 2008, a team member verified that the Environmental Covenant for the COU remains in the Rocky Flats Administrative Record and on file with the Jefferson County land records, which are used by the Planning and Zoning Department.

No adverse biological conditions were noted during the inspection.

2.2 Landfills

2.2.1 Present Landfill

The PLF is currently inspected quarterly as established in the second 5-year review (DOE 2007b). The PLF M&M Plan (DOE 2008b) was recently revised to align the requirements with RFLMA and to reflect the changes recommended in the 5-year review.

2.2.1.1 Inspection Results

The routine PLF inspection for second quarter CY 2008 was performed on May 29, 2008. An evaluation of the landfill cover vegetation was performed on May 21, 2008. No significant problems were observed during these inspections. Refer to Appendix B, which provides the landfill inspection forms, for more information.

2.2.1.2 Settlement Monuments

Annual settlement monument surveys were performed during first quarter CY 2008. Refer to the survey results in the *Quarterly Report of Site Surveillance and Maintenance Activities, First Quarter Calendar Year 2008* (DOE 2008c) for additional information.

2.2.2 Original Landfill

Formal inspections of the OLF are conducted monthly, consistent with the requirements contained in the OLF M&M Plan (DOE 2006b). It was anticipated that after the first year, the inspection frequency might be reduced to quarterly for an additional 4 years. However, because of observed localized slumping and seep areas, and repairs to the OLF cover that were being planned, no change to the monthly inspection frequency was recommended in the second 5-year review (DOE 2007b).

2.2.2.1 Inspection Results

Routine OLF inspections during second quarter CY 2008 were performed on April 30, May 29, and June 24, 2008. An evaluation of the landfill cover vegetation was performed on May 21, 2008. Refer to the completed inspection forms in Appendix B for additional information.

2.2.2.2 Seeps

Seeps #4, #7, and #8 at the OLF were evaluated during the monthly inspections and during unscheduled visits. Seep #7 was found to be dry during all three monthly inspections. Seeps #4 and #8 showed areas of active groundwater seepage at a rate of approximately 1 to 3 gallons per minute (gpm) throughout the second quarter.

Other smaller seeps showed areas of wetness only temporarily after precipitation events. None produced any surface flow.

2.2.2.3 Slumps

Slumps at the OLF continued to be monitored. There were no significant changes to report.

2.2.2.4 Settlement Monuments

The OLF settlement monuments were surveyed on June 26, 2008. Preliminary survey data indicate that settling at each monument does not exceed the limits published in the OLF M&M Plan. Refer to survey results in Appendix B for additional information.

2.2.2.5 Consolidation Monitors

The OLF consolidation monitors were surveyed on April 4, May 2, and June 5, 2008. Refer to the survey results in Appendix B for more information.

2.2.2.6 Geotechnical Investigation

Conditions that warranted repair and that triggered further investigation were found at the OLF during the 2007 inspections, as described in the quarterly and annual reports for 2007 and the first quarterly report for 2008 (DOE 2007c, 2007d, 2008c, 2008d, 2008e).

The *Rocky Flats Original Landfill Geotechnical Investigation Report* (Geotech Report) (DOE 2008f) was delivered to CDPHE for review on June 5, 2008. On June 19, DOE, CDPHE,

EPA, and Stoller staff met to discuss the recommendations to reach agreement on a path forward for OLF repairs and the design scope to allow final design and procurement.

The OLF investigation found that an organic material layer may cause a weak zone that can cause the slope-stability safety factor to become less than 1 on a localized basis, especially when modeled for groundwater impact on the organic material layer. However, the buttress at the base of the OLF is adequate to prevent any large-scale slope failure. The parties agreed that a large stabilization project is not required at this time. Engineering is proceeding with a design based on the agreed-upon path forward for regrading the berm channels, adjusting berm heights based on a subdrainage model for each berm area, installing an extension to the Seep #7 drain, and filling the perimeter channels in places to reduce the channel slopes and depths.

On June 24, 2008, CDPHE notified DOE that the Geotech Report is acceptable; it met the criteria agreed to in the work plan for the investigation.

Design work for the repairs is ongoing. Work is expected to begin in the third quarter, pending further RFLMA Party consultation and CDPHE approval of designs, as necessary.

2.3 Groundwater Treatment Systems

Four groundwater treatment systems are operated and maintained in accordance with requirements defined in RFLMA and the RFSOG. Three of these systems (the Mound Site Plume Treatment System [MSPTS], East Trenches Plume Treatment System [ETPTS], and Solar Ponds Plume Treatment System [SPPTS]) include a groundwater intercept trench (collection trench), which is similar to a French drain with an impermeable membrane on the downgradient side. Groundwater entering the trench is routed through a drain pipe into one or more treatment cells, where it is treated and then discharged. The fourth system, the PLF Treatment System (PLFTS), treats water from the northern and southern components of the groundwater intercept system (GWIS) and flow from the PLF seep.

2.3.1 Mound Site Plume Treatment System

Routine maintenance activities continued at the MSPTS through second quarter CY 2008. These activities included raking the media each week, checking and flushing filters, and inspecting influent and effluent flow conditions.

2.3.2 East Trenches Plume Treatment System

Routine maintenance activities continued at the ETPTS through second quarter CY 2008. This included raking the media each week, checking and flushing filters, and inspecting influent and effluent flow conditions.

2.3.3 Solar Ponds Plume Treatment System

Routine maintenance activities continued at the SPPTS through second quarter CY 2008. This included weekly inspections of the solar/battery system that powers the pump, the operation of the pump, and influent and effluent flow conditions.

2.3.4 PLF Treatment System

Routine maintenance activities continued at the PLFTS through second quarter CY 2008. These activities generally consisted of inspecting the system for any issues or potential problems.

2.4 Erosion Control and Revegetation

Maintenance of the Site erosion control features required continued effort throughout second quarter CY 2008, especially following high-wind or precipitation events. Repairs were made to erosion wattles and matting loosened and displaced by high winds or rain. Erosion controls were installed and maintained for the various projects that were ongoing during the second quarter. Several areas were interseeded with additional native species to increase vegetation cover there.

3.0 Environmental Monitoring

3.1 Water Monitoring

This quarterly report presents data collected during second quarter CY 2008 (April through June). This section includes:

- A discussion of analytical results for the Point of Compliance (POC), Point of Evaluation (POE), PLF, and OLF monitoring objectives; and
- A summary of Area of Concern (AOC) well, Boundary well, Evaluation well, and Sentinel well monitoring; treatment system monitoring; and Resource Conservation and Recovery Act (RCRA) groundwater monitoring and surface water support monitoring at the Site.

Monitoring locations, sampling criteria, and evaluation protocols for all water monitoring objectives in the following sections are detailed in Attachment 2 of RFLMA and the RFSOG. Analytical water-quality data for second quarter CY 2008 are provided in Appendix C.

3.1.1 Water Monitoring Highlights

During second quarter CY 2008, the water monitoring network successfully met the targeted monitoring objectives as required by RFLMA and in conformance with the RFSOG implementation guidance. The network consisted of 11 automated gaging stations, 10 surface water grab-sampling locations, 8 treatment system locations, 100 wells, and 8 precipitation gages. During the quarter, 19 flow-paced composite samples, 7 surface water grab samples, 8 treatment system samples, and 89 groundwater samples were collected.[1]

One monitoring well was sampled for the first time ever in second quarter CY 2008. Following sample collection in fourth quarter CY 2007, Sentinel well 45605 was abandoned to support the regrading of the slump in which it was installed, south of former Building 991. Its replacement, Sentinel well 45608, was installed in March 2008 approximately 9 feet west of the original

[1] Composite samples consist of multiple aliquots ("grabs") of identical volume. Each grab is delivered by the automatic sampler to the composite container at each predetermined flow volume or time interval. During second quarter CY 2008, the 19 flow-paced composites comprised 385 individual grabs.

well's location. This replacement well is assigned all of the objectives and decision rules of the original well. After well 45608 was properly developed, it was then sampled in May 2008.

All water-quality data at the RFLMA POCs remained well below the applicable standards through second quarter CY 2008.

Reportable 12-month rolling average total uranium (U) concentrations continued to be observed in surface water at RFLMA POE monitoring station GS10, which is located in South Walnut Creek upstream of Pond B-1 in the Walnut Creek Basin.

The Site continues to evaluate, in coordination with CDPHE and under RFLMA, the measured U concentrations at GS10. Recent GS10 data continue to support the conclusion that the reportable U activities are likely a result of changing hydrologic conditions (particularly the increasing groundwater component with naturally occurring U in surface water flows at GS10, relative to conditions that prevailed prior to Site closure), and that no specific remedial action is indicated at this time. The data do not suggest a previously unknown localized source of contamination that warrants targeted action.

All other POE analyte concentrations remained below reporting levels as of the end of second quarter CY 2008. Erosion and runoff controls, as well as extensive revegetation efforts, have proven to be effective in measurably reducing both sediment transport and constituent concentrations. As of the end of second quarter CY 2008, all of the POEs were showing plutonium-239,240 (Pu) and americium-241 (Am) concentrations well below the RFLMA standards. With the removal of impervious areas resulting in decreased runoff, the stabilization of soils within the drainages, and the progression of revegetation, acceptable water quality is expected to continue.

Groundwater monitoring results will be evaluated as part of the 2008 annual report.

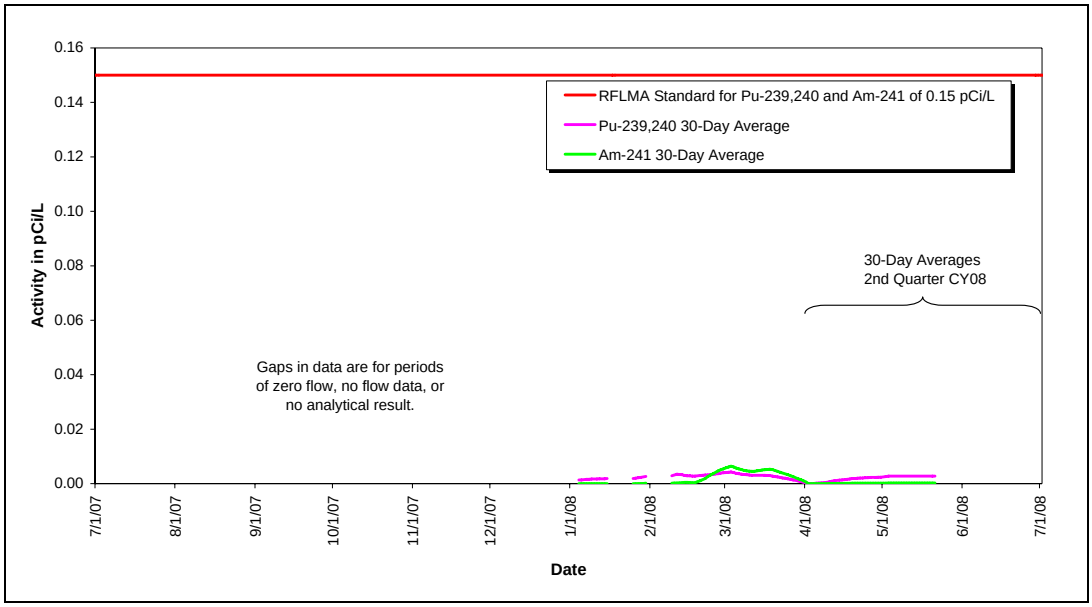
3.1.2 POC Monitoring

The following sections include summary tables and plots showing the applicable 30-day and 12-month rolling averages for the POC analytes.

3.1.2.1 Location GS01

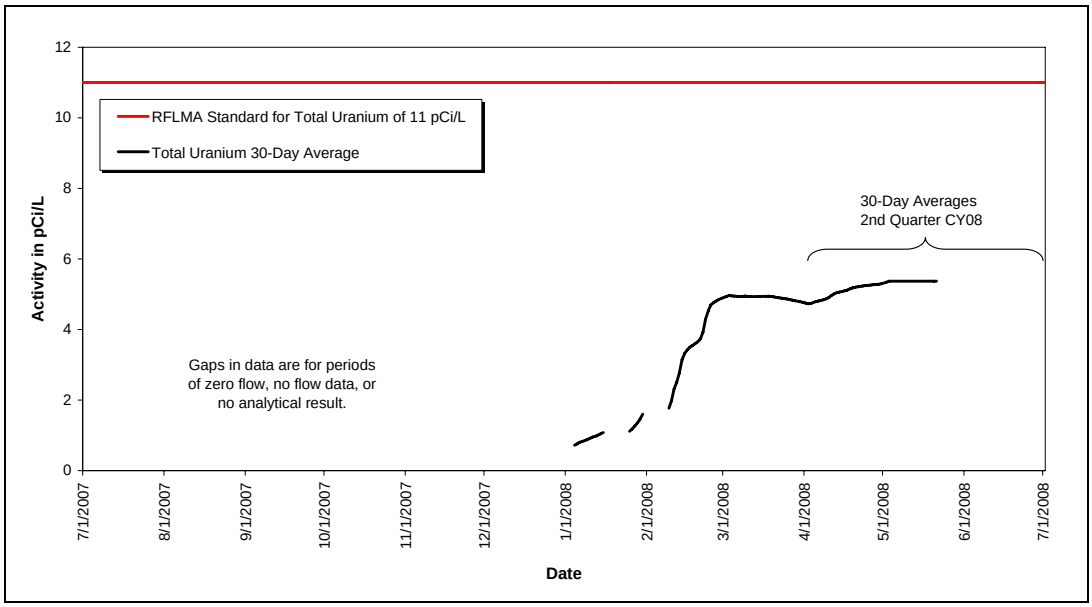
Monitoring location GS01 is located on Woman Creek at Indiana Street. Figure 3−1 and Figure 3−2 show no occurrences of reportable 30-day averages for the quarter.[2]

[2] The GS01 composite samples started on May 22, 2008, were still in progress as of the publication of this report. Therefore, data for GS01 are complete through May 21, 2008.



Data through 5/21/08. pCi/L = picocuries per liter

Figure 3−1. Volume-Weighted 30-Day Average Pu and Am Activities at GS01: Calendar Year Ending Second Quarter CY 2008

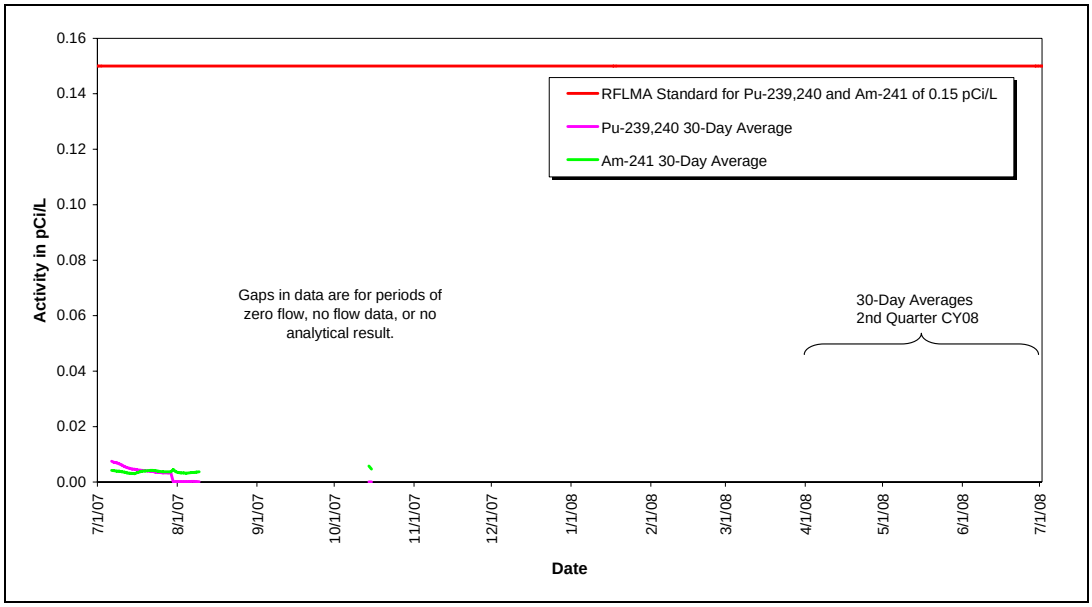


Data through 5/21/08. pCi/L = picocuries per liter

Figure 3−2. Volume-Weighted 30-Day Average Total U Activities at GS01: Calendar Year Ending Second Quarter CY 2008

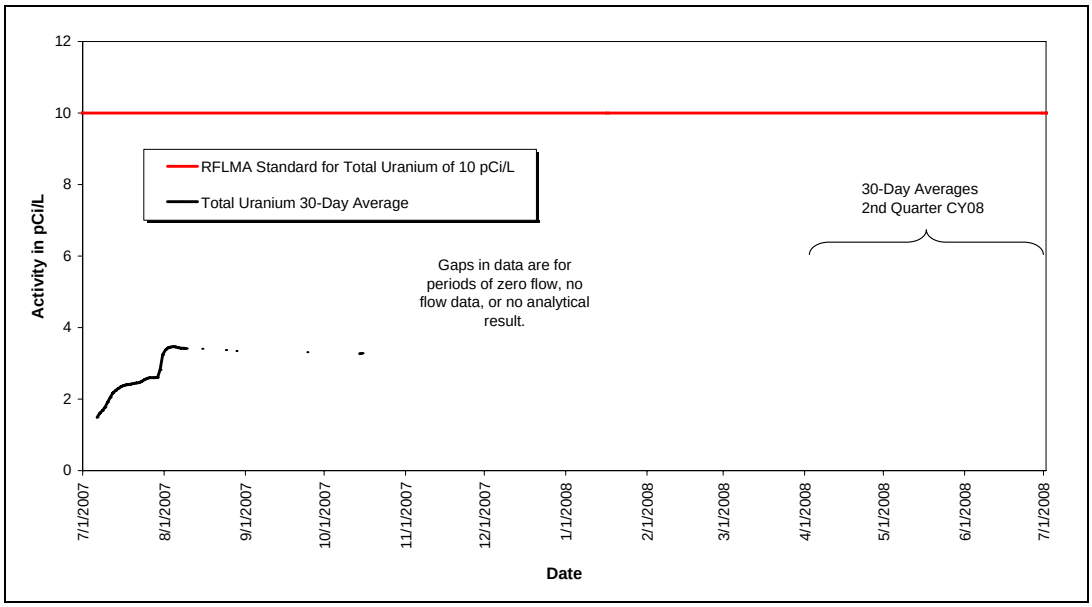
3.1.2.2 Location GS03

Monitoring location GS03 is located on Walnut Creek at Indiana Street. Figure 3−3, Figure 3−4, and Figure 3−5 show no occurrences of reportable 30-day averages for the quarter.



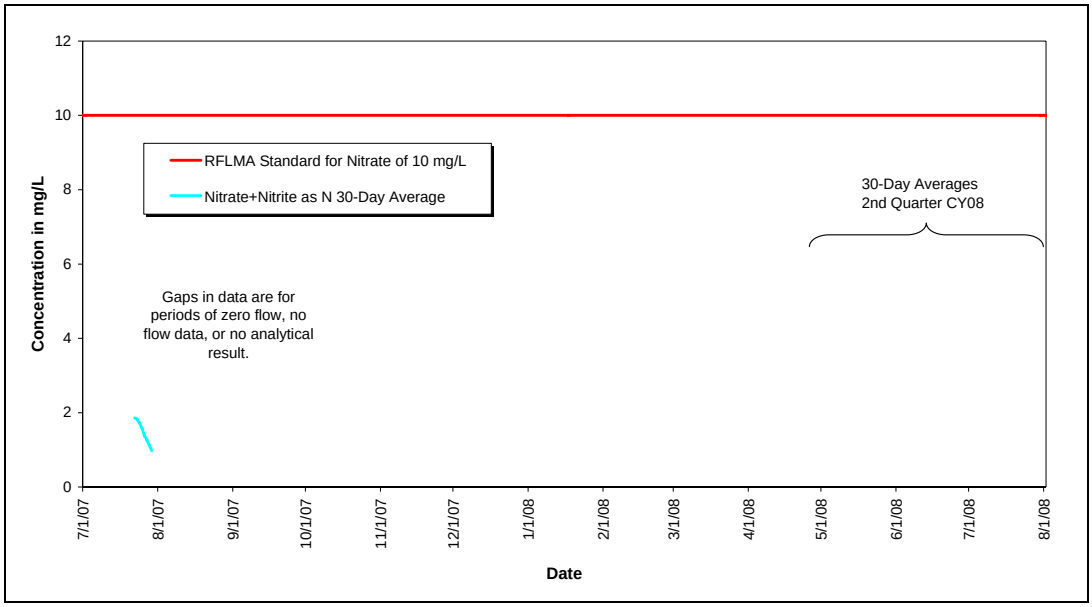
pCi/L = picocuries per liter

Figure 3−3. Volume-Weighted 30-Day Average Pu and Am Activities at GS03: Calendar Year Ending Second Quarter CY 2008



pCi/L = picocuries per liter

Figure 3−4. Volume-Weighted 30-Day Average Total U Activities at GS03: Calendar Year Ending Second Quarter CY 2008

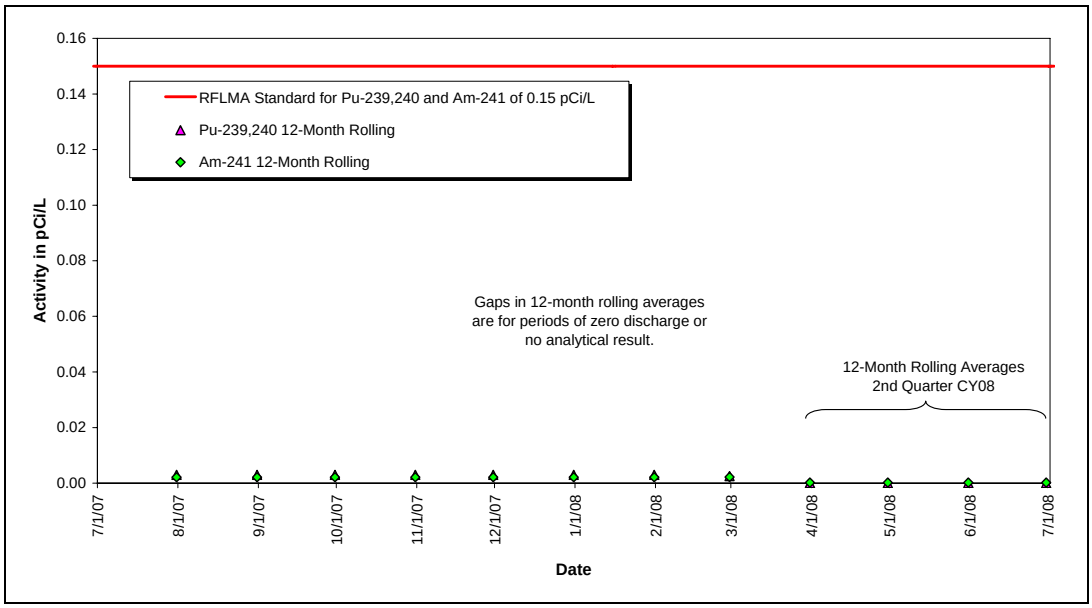


Note: NO_3 + NO_2 as N 12-month averages are conservatively compared to the NO_3 standard only.
mg/L = milligrams per liter

Figure 3−5. Volume-Weighted 30-Day Average NO_3 + NO_2 as N Concentration at GS03: Calendar Year Ending Second Quarter CY 2008

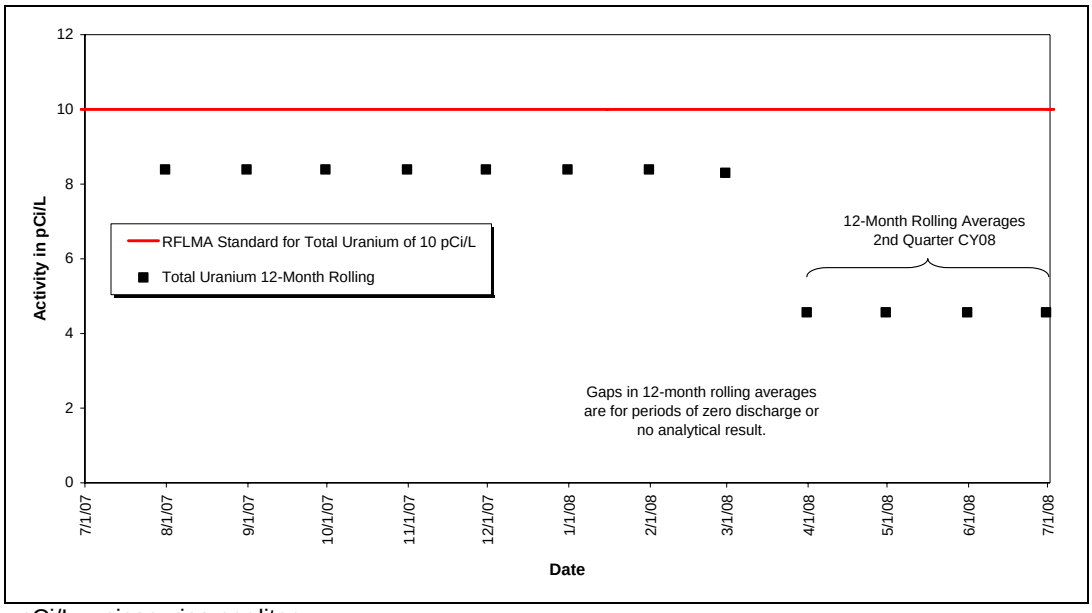
3.1.2.3 Location GS08

Monitoring location GS08 is located on South Walnut Creek at the outlet of Pond B-5. Figure 3−6, Figure 3−7, and Figure 3−8 show no occurrences of reportable 12-month rolling averages for the quarter.



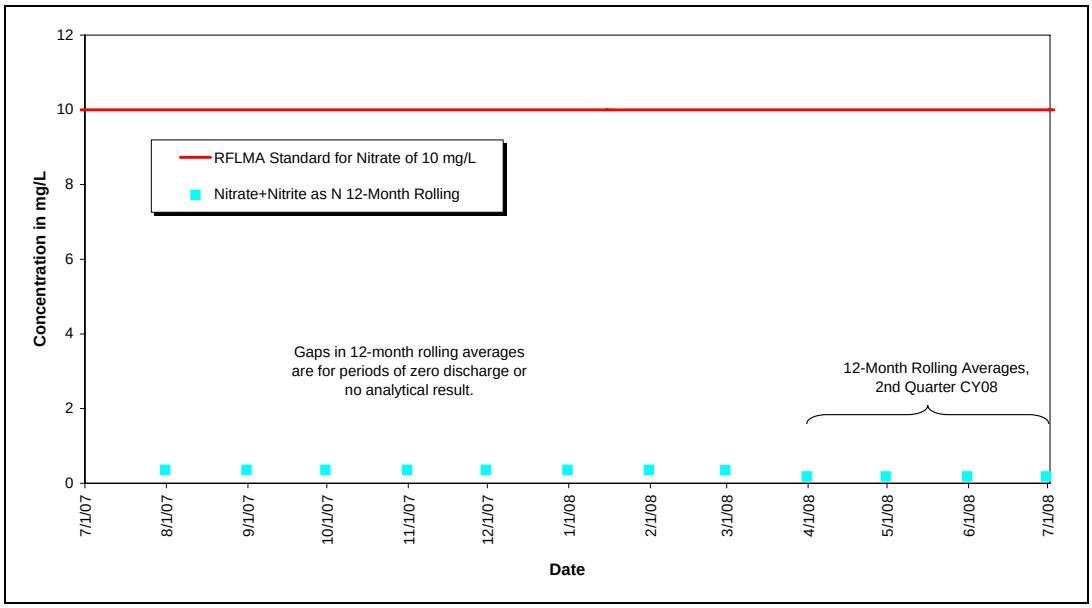
pCi/L = picocuries per liter

Figure 3−6. Volume-Weighted 12-Month Rolling Average Pu and Am Activities at GS08: Calendar Year Ending Second Quarter CY 2008



pCi/L = picocuries per liter

Figure 3−7. Volume-Weighted 12-Month Rolling Average Total U Activities at GS08: Calendar Year Ending Second Quarter CY 2008

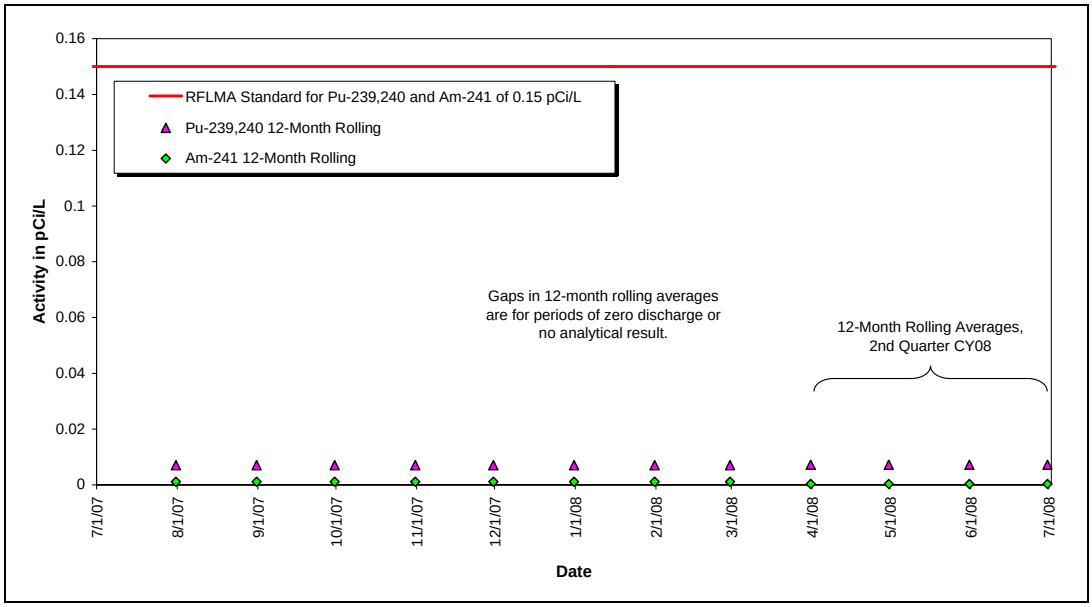


Note: NO_3 + NO_2 as N 12-month averages are conservatively compared to the NO_3 standard only.
mg/L = milligrams per liter

Figure 3−8. Volume-Weighted 12-Month Rolling Average NO_3 + NO_2 as N Concentrations at GS08: Calendar Year Ending Second Quarter CY 2008

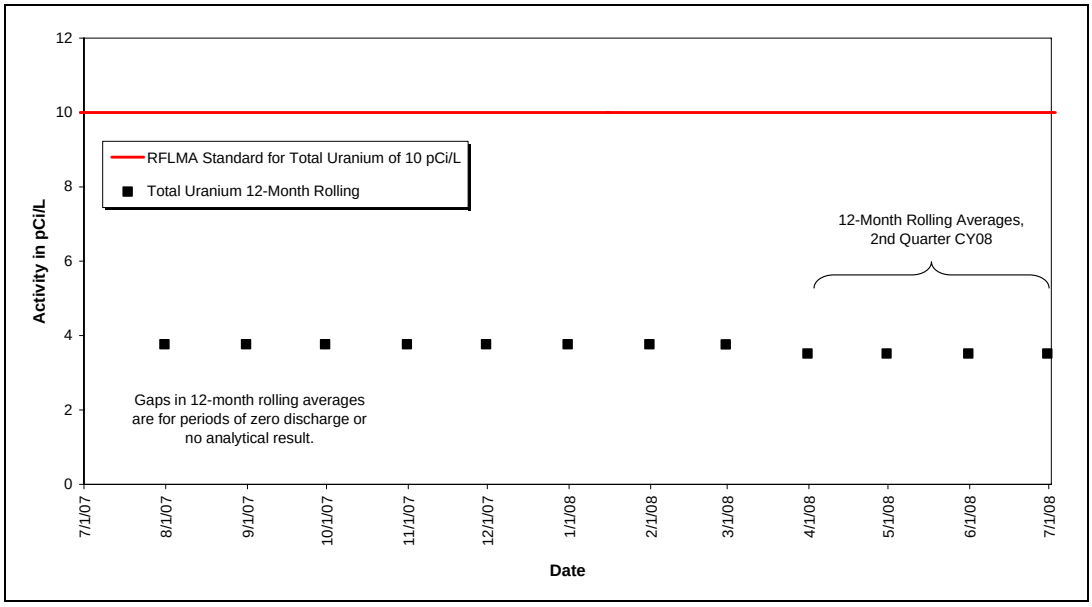
3.1.2.4 Location GS11

Monitoring location GS11 is located on North Walnut Creek at the outlet of Pond A-4. Figure 3−9, Figure 3−10, and Figure 3−11 show no occurrences of reportable 12-month rolling averages for the quarter.



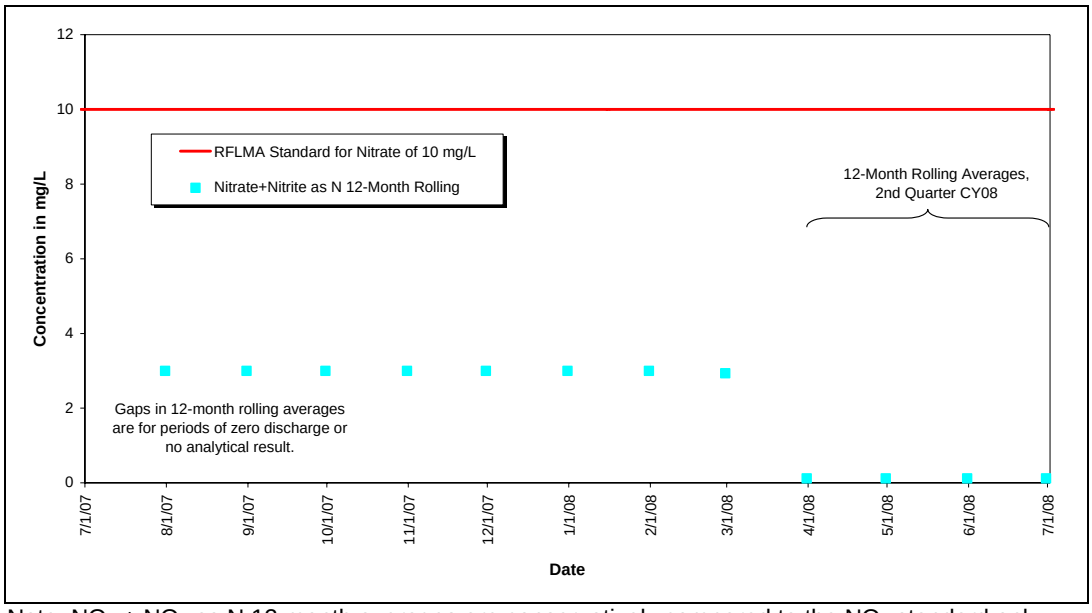
pCi/L = picocuries per liter

Figure 3−9. Volume-Weighted 12-Month Rolling Average Pu and Am Activities at GS11: Calendar Year Ending Second Quarter CY 2008



pCi/L = picocuries per liter

Figure 3−10. Volume-Weighted 12-Month Rolling Average Total U Activities at GS11: Calendar Year Ending Second Quarter CY 2008



Note: NO_3 + NO_2 as N 12-month averages are conservatively compared to the NO_3 standard only.
mg/L = milligrams per liter

Figure 3−11. Volume-Weighted 12-Month Rolling Average NO_3 + NO_2 as N Concentrations at GS11: Calendar Year Ending Second Quarter CY 2008

3.1.2.5 Location GS31

Monitoring location GS31 is located on Woman Creek at the outlet of Pond C-2.

Pond C-2 has not been discharged during CY 2008. The last discharge occurred during the July 1−July 14, 2005, timeframe. Therefore, no 12-month rolling averages can be calculated after June 30, 2006, and no compliance plots are presented.

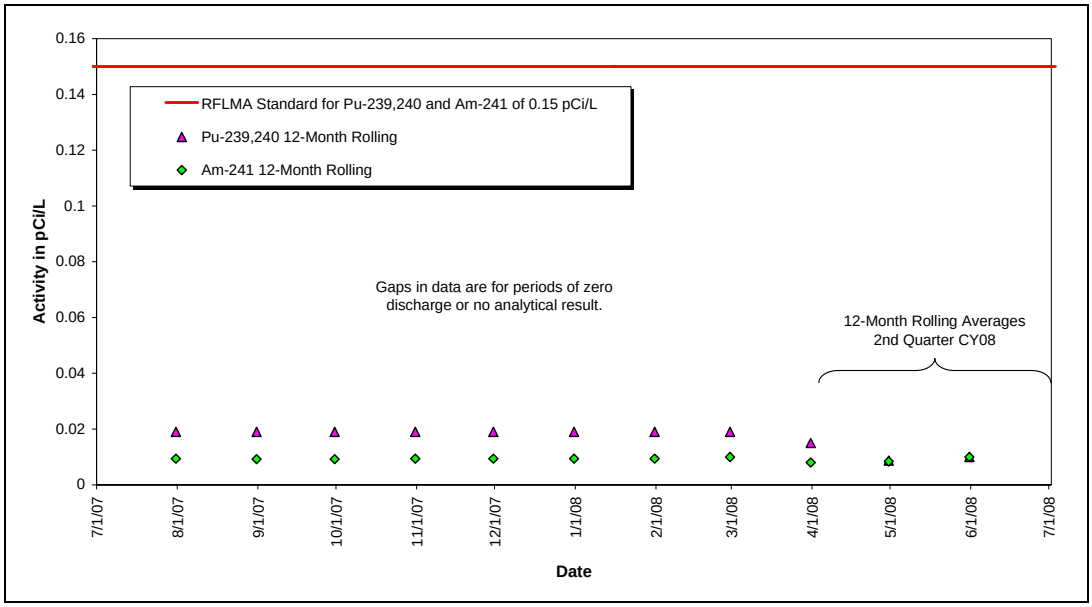
3.1.3 POE Monitoring

The following sections include summary tables and plots showing the applicable 30-day and 12-month rolling averages for the POE analytes.

3.1.3.1 Location GS10

Monitoring location GS10 is located on South Walnut Creek just upstream of the B-Series Ponds. Figure 3−12 shows no reportable Pu or Am values during the quarter. None of the 85th percentile 30-day average metals concentrations were reportable for the quarter.[3]

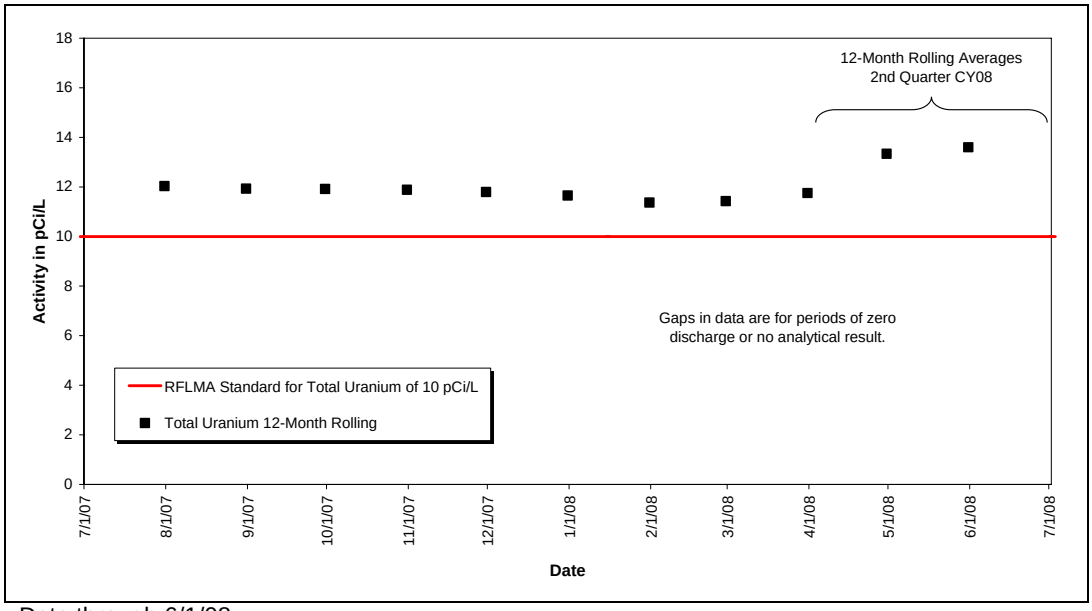
[3] Analytical results for the GS10 composite sample for the period from 13:38 on June 2, 2008, to 10:50 on August 6, 2008, were not available as of the publication of this report. Therefore, data are complete through June 1, 2008.



Data through 6/1/08.
pCi/L = picocuries per liter

Figure 3−12. Volume-Weighted Average Pu and Am Compliance Values at GS10: Calendar Year Ending Second Quarter CY 2008

Figure 3−13 shows reportable 12-month rolling averages for total U during the quarter. The Site continues to evaluate, in coordination with CDPHE, the measured U concentrations at GS10.

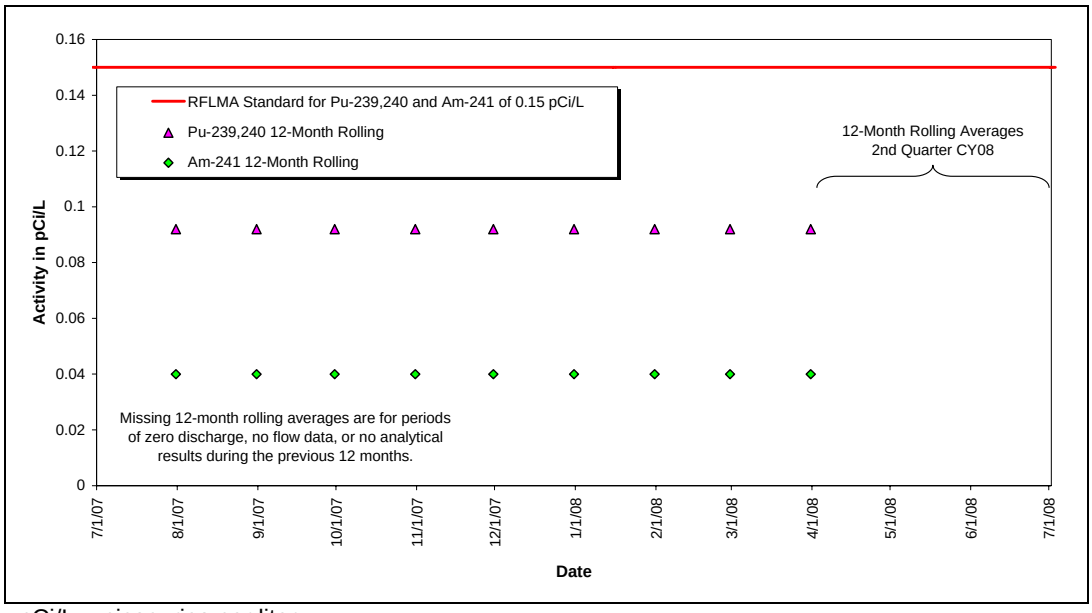


Data through 6/1/08.
pCi/L = picocuries per liter

Figure 3−13. Volume-Weighted Average Total U Compliance Values at GS10: Calendar Year Ending Second Quarter CY 2008

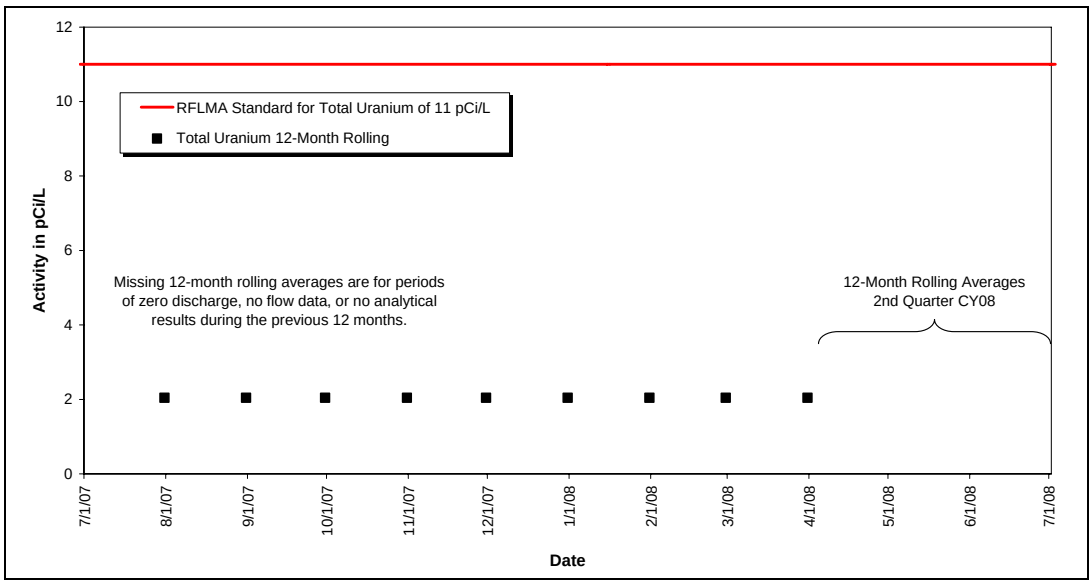
3.1.3.2 Location SW027

Monitoring location SW027 is located at the end of the South Interceptor Ditch at the inlet to Pond C-2. Figure 3−14 and Figure 3−15 show no reportable Pu, Am, or total U values during the quarter. None of the 85th percentile 30-day average metals concentrations were reportable for the quarter.



pCi/L = picocuries per liter

Figure 3−14. Volume-Weighted Average Pu and Am Compliance Values at SW027: Calendar Year Ending Second Quarter CY 2008

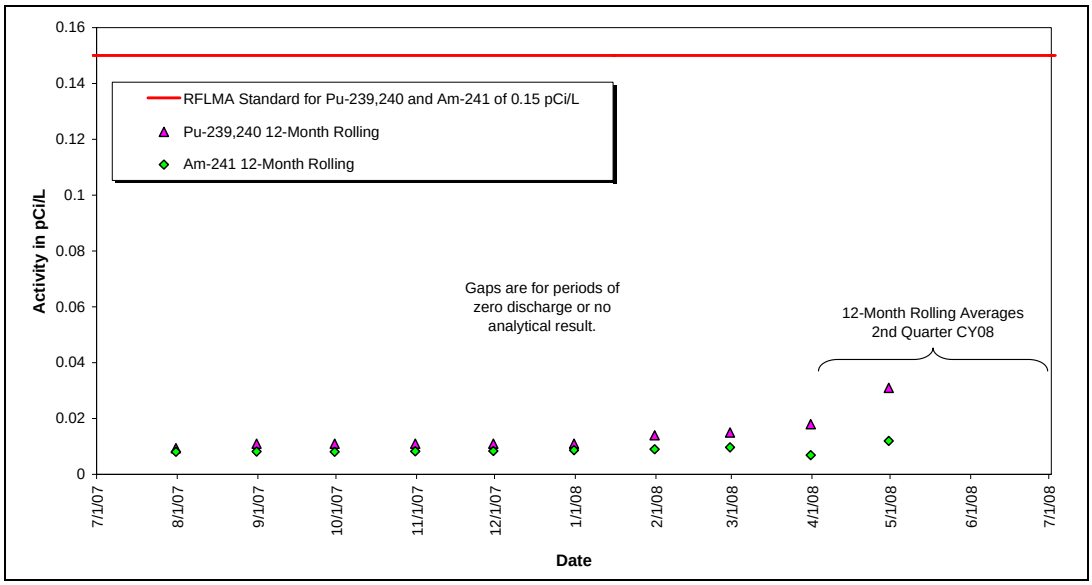


pCi/L = picocuries per liter

Figure 3−15. Volume-Weighted Average Total U Compliance Values at SW027: Calendar Year Ending Second Quarter CY 2008

3.1.3.3 Location SW093

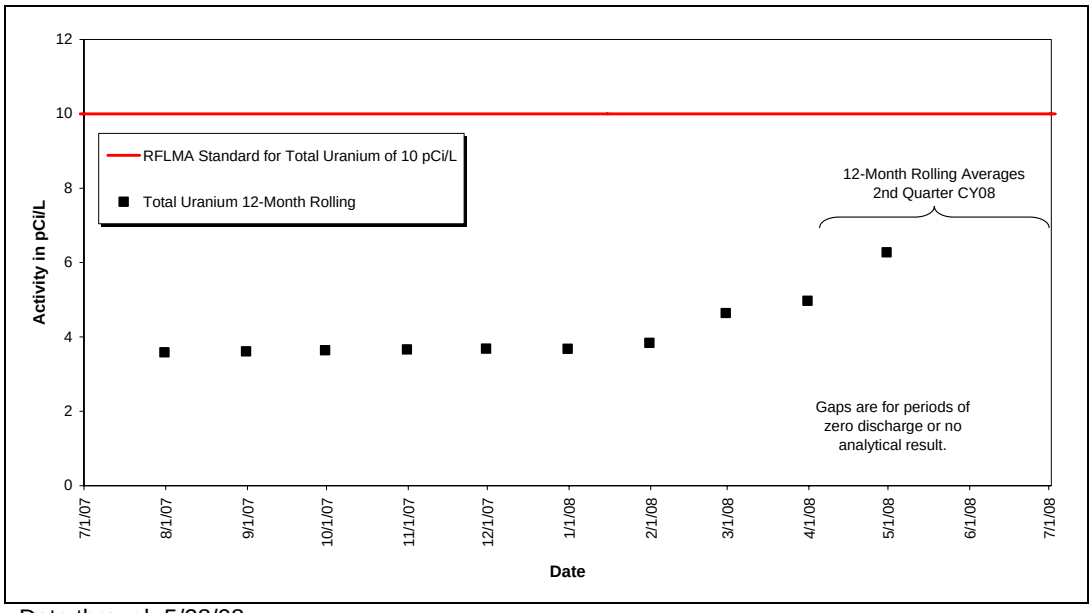
Monitoring location SW093 is located on North Walnut Creek 1,300 feet upstream of the A-Series Ponds. Figure 3−16 and Figure 3−17 show no reportable Pu, Am, or total U values during the quarter. None of the 85th percentile 30-day average metals concentrations were reportable for the quarter.[4]



Data through 5/28/08.
pCi/L = picocuries per liter

Figure 3−16. Volume-Weighted Average Pu and Am Compliance Values at SW093: Calendar Year Ending Second Quarter CY 2008

[4] Analytical data for the SW093 composite sample for the period from 8:53 on May 29, 2008, through 9:44 on August 12, 2008, were not available as of the publication of this report. Therefore, data are complete through May 28, 2008.



Data through 5/28/08.
pCi/L = picocuries per liter

Figure 3−17. Volume-Weighted Average Total U Compliance Values at SW093: Calendar Year Ending Second Quarter CY 2008

3.1.4 AOC Wells and Surface Water Location SW018

All AOC wells and SW018 were scheduled for RFLMA monitoring in second quarter CY 2008. No reportable conditions were indicated. NO_3 concentrations in groundwater samples from well B206989 continue to exceed the applicable standard, which is addressed in Contact Record 2007-06, issued October 12, 2007. Analytical results (Appendix C) will be discussed and statistically evaluated as part of the 2008 annual report.

3.1.5 Boundary Wells

All Boundary wells were scheduled for RFLMA monitoring in second quarter CY 2008. No reportable conditions were indicated. Analytical results (Appendix C) will be discussed and statistically evaluated as part of the 2008 annual report.

3.1.6 Sentinel Wells

All Sentinel wells were scheduled for RFLMA monitoring in second quarter CY 2008. Analytical results (Appendix C) will be discussed and statistically evaluated as part of the 2008 annual report.

3.1.7 Evaluation Wells

All Evaluation wells were scheduled for RFLMA monitoring in second quarter CY 2008. Analytical results (Appendix C) will be discussed and statistically evaluated as part of the 2008 annual report.

3.1.8 PLF Monitoring

All RCRA groundwater monitoring wells at the PLF were sampled during second quarter CY 2008. Analytical results (Appendix C) will be discussed and statistically evaluated as part of the 2008 annual report. Surface water monitoring at the PLF is discussed in Section 3.1.10.4.

3.1.9 OLF Monitoring

All RCRA groundwater monitoring wells at the OLF were sampled during second quarter CY 2008. Analytical results (Appendix C) will be discussed and statistically evaluated as part of the 2008 annual report. Surface water downgradient of the OLF, as monitored at location GS59, shows no adverse impact from the OLF due to elevated concentrations of boron or U in groundwater.

During second quarter CY 2008, when routine surface water sampling was performed at Woman Creek downstream of the OLF (GS59), the analytical result for selenium was greater than the applicable surface water standard (Table 3−1).

Table 3−1. Woman Creek (GS59): Summary of Routine Second Quarter CY 2008 Sampling Analytical Results Exceeding RFLMA Surface Water Standards

Composite Sample Period	Analyte	Result	Unit	RFLMA Standard	Basis for Standard[a]
5/14/08 10:19 – 6/25/08 9:34	Selenium	7.0	µg/L	4.6	AL

Note: [a] Basis acronyms: AL = aquatic life
µg/L = micrograms per liter

For selenium at GS59, the routine result triggered increased monthly sampling frequency per the RFLMA flowchart (Table 3−2). The subsequent sample also showed selenium to be above the standard. Increased sampling frequency continues at GS59. Should the third consecutive sample show selenium to be above the standard, the RFLMA consultative process will be triggered.

Table 3−2. Woman Creek (GS59): Summary of Monthly Analytical Results

Analyte	Composite Sample Period	Result	Unit
Selenium	**5/14/08 10:19 – 6/25/08 9:34**	**7.0**	**µg/L**
	6/25/08 9:34 – 7/21/08 11:58	8.2	µg/L
	7/21/08 11:58 – 8/16/08 13:13	analysis pending	µg/L
	Status:	Continue monthly sampling for selenium	

Note: The initial result triggering monthly sampling is shown in **bold**.
µg/L = micrograms per liter

3.1.10 Groundwater Treatment System Monitoring

As described in Section 2.2, contaminated groundwater is intercepted and treated in four areas of the Site. The MSPTS, ETPTS, and SPPTS include a groundwater intercept trench. Groundwater entering the trench is routed through a drain pipe into one or more treatment cells, where it is

treated and then discharged to surface water. The PLFTS treats water from the northern and southern components of the GWIS and flow from the PLF seep.

3.1.10.1 Mound Site Plume Treatment System

All MSPTS monitoring locations were scheduled for RFLMA sampling in second quarter CY 2008. Analytical results (Appendix C) will be discussed and statistically evaluated as part of the 2008 annual report.

3.1.10.2 East Trenches Plume Treatment System

All ETPTS monitoring locations were scheduled for RFLMA sampling in second quarter CY 2008. Analytical results (Appendix C) will be discussed and statistically evaluated as part of the 2008 annual report.

3.1.10.3 Solar Pond Plume Treatment System

All SPPTS monitoring locations were scheduled for RFLMA sampling in second quarter CY 2008. Analytical results (Appendix C) will be discussed and statistically evaluated as part of the 2008 annual report.

3.1.10.4 PLF Treatment System

During collection of the May 7, 2008, sample at the system influent (location PLFSEEPINF), the flow rate was 1.11 gpm. As of June 30, 2008, the Landfill Pond outlet remained in an open configuration.

During second quarter CY 2008, routine sampling of the treated effluent exiting the system (location PLFSYSEFF) showed that dissolved cadmium and selenium were greater than the applicable surface water standards
(Table 3−3).

Table 3−3. PLFTS Effluent (PLFSYSEFF): Summary of Routine Second Quarter CY 2008 Grab Sampling Analytical Results Exceeding RFLMA Surface Water Standards (May 7, 2008, Sample)

Analyte	Result	Unit	RFLMA Standard	Basis for Standard[a]
Cadmium, dissolved	1.9	µg/L	1.5	TVS
Selenium	34.8	µg/L	4.6	AL

Note: [a] Basis acronyms: AL = aquatic life; TVS = table value standard
µg/L = micrograms per liter
TVSs for metals are based on a toxicity equation that uses a hardness value of 143 milligrams per liter.

For cadmium and selenium at PLFSYSEFF, the routine quarterly results triggered monthly sampling per the RFLMA flowchart (Table 3−4). The subsequent sample collected contained dissolved cadmium at a concentration equal to the RFLMA standard. Given this result, monthly sampling of the PLFTS effluent for dissolved cadmium was discontinued. Although the subsequent sample at PLFSYSEFF contained a selenium concentration above the RFLMA standard, the third sample collected did not contain a detectable concentration. Consequently, monthly sampling of the PLFTS effluent for selenium was also discontinued.

Table 3−4. PLFTS Effluent (PLFSYSEFF): Summary of Monthly Analytical Results

Analyte	Sample Date	Result	Unit
Cadmium, dissolved	***5/7/08***	***1.9***	***µg/L***
	7/9/08	*1.5*	*µg/L*
	Status:	Discontinue monthly sampling for dissolved cadmium	
Selenium	***5/7/08***	***34.8***	***ug/L***
	7/9/08	*13.0*	*ug/L*
	8/12/08	not detected*	ug/L
	Status:	Discontinue monthly sampling for selenium	

Note: The initial result triggering monthly sampling is shown in **bold**. The routine quarterly sample results are shown in *italics*.
µg/L = micrograms per liter

3.1.11 Pre-Discharge Monitoring

Pre-discharge samples are collected prior to discharge at Ponds A-4, B-5, and C-2 on North Walnut Creek, South Walnut Creek, and Woman Creek, respectively.

No ponds were pre-discharge-sampled during second quarter CY 2008.

4.0 Adverse Biological Conditions

There was no evidence of adverse biological conditions (e.g., unexpected mortality or morbidity) observed during monitoring and maintenance activities in second quarter CY 2008.

5.0 References

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Appendix A

Annual Inspection Checklist, Maps, and Photographs

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Appendix B

Landfill Inspection Forms and Survey Data

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Appendix C

Analytical Results for Water Samples—Second Quarter CY 2008

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